An Evaluation of Generic Skills Outcomes in Engineering Education In Hong Kong

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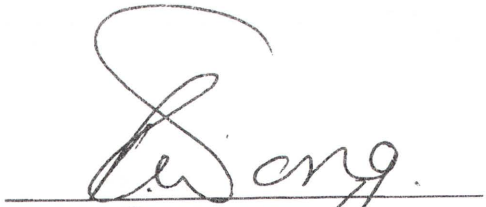
EdD Thesis

The University of Technology, Sydney

2009

Certificate of Originality

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written nor material which has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.



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Acknowledgment

I would like to express my sincere appreciation and thanks to my Principal Supervisor, Associate Professor Robert Pithers, for his valuable guidance, support and encouragement. I am most grateful for the guidance he gave me on a chapter by chapter basis. His support and encouragement through these five years have inspired me to complete this thesis.

I would like to thank my wife, Theresa Wong, she spent her retirement time and stayed with me in Hong Kong instead of in Canada, supported and encouraged my study of the UTS EdD programme in Hong Kong. She even stayed alone by herself during the week-ends and holidays without a word of complaint. Her endless love and care are the essential key elements for the completion of this dissertation.

I would like to thank my Co-Principal Supervisor, Dr. Tony Holland, for his suggestion and advice to conduct study on generic skills research for graduate engineers in Hong Kong, Dr. Alison Lee, for her encouragement and support for conducting the study.

Last, but not least, I am grateful for my EdD (2004) classmates. The yearly get together dinner and lunch meeting functions do provide a forum for us to air our frustrations and our concerns. At the same time, our comforts and encouragements that make lots of differences for all of us to continue our study.

Abstract

A survey driven evaluation of the outcomes of generic skills in higher engineering education in Hong Kong was conducted. The survey techniques involved questionnaire and interviews with both recently graduated engineers and their work-related engineering managers as well as with a focus group of university academics. The results indicated that, overall, mostly the recently graduated engineers did possess adequate levels of generic-type skills to carry out their basic tasks in the workplace. However, the graduate engineers appeared to be insufficiently prepared in certain specific areas, especially for job-related problem-solving and communication skills. The study's results also indicated that the majority of the graduate engineers and the engineering managers, viewed problem-solving and communication skills are most important priorities for the engineering profession. The majority of the engineering managers also rated the graduate engineers as generally satisfactory in performing their tasks in their organization.

The results of the self evaluation of the overall knowledge and skills, relevant to the generic-type skills learned at university by the graduate engineers, indicated that a significant percentage did not have adequate generic-type skills to carry out a range of tasks in their workplace setting. The findings from the surveyed employers were of a similar nature, although some interesting differences in perception emerged. Some of the recent graduates were also critical of certain subject material content, inadequately provided in some of their university subjects.

With the political change in Hong Kong society, the strategic improvement in communication in both English and Chinese (Putonghua) becomes more critical for the

Hong Kong university graduates, because Hong Kong is closely tied with China and the Western world. Other generic-type skills, such as problem-solving techniques, inter-personal skills, team building, creative thinking, work integrity and ethics are absolutely necessary for all engineering graduates to meet the new requirements of the workplace. The importance of the generic-type skills was validated by the study results and showed agreement in these areas across industry (engineering managers) between graduate engineers and academics.

Well educated citizens in Hong Kong will determine Hong Kong's competitiveness and its future. The process applied to teaching and learning in university and will also significantly affect future graduate engineers. Strategic improvements such as stressing the importance of communications in both English and Chinese (Putonghua), in addition, the application of problem-based learning, work-integrated-learning and lifelong learning are recommended to be improved in teaching and learning in university education. Lifelong learning, self-motivation and sense of self-efficacy are a must for all graduates in order to meet the new challenges of this changing world.

Today, we live in an age when technology is advancing faster than at any other time in history. Educators should educate and provide graduates with generic-type skills to help them adapt intellectually to a changing world. Advances in technologies have also put engineering education at the forefront of innovation and creativity, two traits which have contributed to Hong Kong's global status. The old misconception that engineers are only about technology, needs to be broken. Engineers who can communicate, have innovative mindset problem solving skills plus good people skills and leadership ability, as well as be technically competent and proficient are needed in the 21st century.

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